CHAPTER 2
FUNDAMENTALS OF OPERATING SYSTEM

SHORT AND LONG QUESTIONS

Q.1 What is an operating system?

Ans: Operating System:

Operating system is a collection of system software that controls the working of computer system. It acts as an interface between the computer user and computer. It facilitates program execution and helps in developing application programs.

Q.2 List common types of operating systems?

Ans: Common Types of Operating Systems:

There are three types of operating systems based on ways of interaction with computer (interface). The three types of interfaces are:

- Command Line Interface.
- Menu Driven Interface.
- Graphical User Interface (GUI).

Q.3 What is Disk Operating System (DOS)?

Ans: Disk Operating System (DOS):

DOS was the most popular CLI operating system. DOS displays the prompt **(C:\>)** to enter commands. User must know the syntax of the command. DOS commands are difficult to remember. Some DOS commands are still supported by the new Windows operating system. It is a single user and single task operating system.

```
C:\DOSTEST>dir
 Volume in drive C has no label.
 Volume Serial Number is 7E8A-FA7D

 Directory of C:\DOSTEST

02/09/2012  13:38    <DIR>          .
02/09/2012  13:38    <DIR>          ..
02/09/2012  13:38                 7 file.txt
               1 File(s)              7 bytes
               2 Dir(s)  133,060,997,120 bytes free

C:\DOSTEST>copy *.txt *_%date:/=%_.txt
file.txt
        1 file(s) copied.

C:\DOSTEST>dir
 Volume in drive C has no label.
 Volume Serial Number is 7E8A-FA7D

 Directory of C:\DOSTEST

02/09/2012  13:40    <DIR>          .
02/09/2012  13:40    <DIR>          ..
02/09/2012  13:38                 7 file.txt
02/09/2012  13:38                 7 file.txt_02092012_.txt
               2 File(s)             14 bytes
               2 Dir(s)  133,050,974,208 bytes free

C:\DOSTEST>
```

DOS Interface

Examples of DOS commands:

The following are some examples of DOS commands with their description

DIR Display the contents of current directory (folder)

FORMAT D: Format the D drive

CD\PICS: CD stands for Change Directory, which makes Pics the current directory

Some DOS commands are shown in Fig.

Do You Know?

Microsoft introduced the MS DOS in 1981 and it was replaced by Windows 3.0 in 1990.

Q.4 List the classification of operating system.

Ans: Classification of Operating System:

Operating systems can be classified into two major categories, single-user and multi -user operating systems.

Q.5 List the types of operating system.

Ans: Types of Operating Systems:

There are three types of operating systems. These are batch processing, Time-sharing and real-time operating systems.

Q.6 A GUI operating system provides a user-friendly interface explain it.

Ans: Getting Started with GUI Operating System:

A GUI Operating System provides a user-friendly interface. This makes it easier for people with little computer skills to operate the computer. A GUI combines four elements which are Window, Icon, Menu and Pointer. All the information displayed on the screen is presented inside a window.

Small graphical symbols known as icons are used to represent files, folders, drives, programs and commands. Menus present various commands from which the user makes a selection with a pointing device. Mouse or touchpad is used as pointing device for performing different tasks such as selecting an option or opening a file, folder or program.

Tip

You can delete a file from your hard disk without sending it to **Recycle Bin** by clicking the file and then pressing **Shift + Delete**

Do You Know?

Right click a shortcut icon, select **Properties** and click **Open File Location** to know the location of program, file or folder to which a shortcut belongs.

Tip

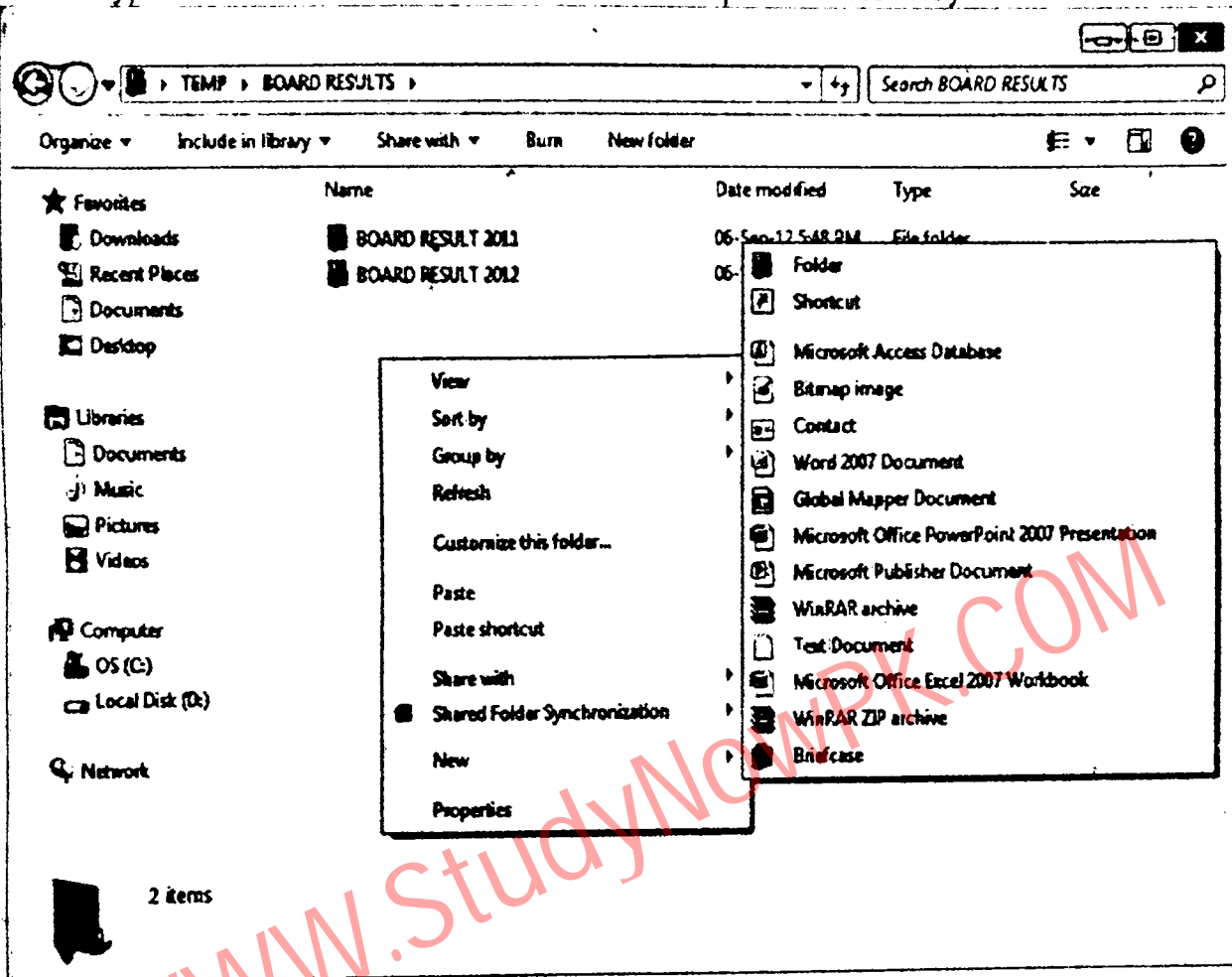
You can create a new folder in Windows Explorer by simply pressing the **Ctrl+Shift+N** keys and then rename it.

Q.7 List the various steps to create a new folder.

Ans: Steps to create a new folder:

The following are the steps to create a new folder.

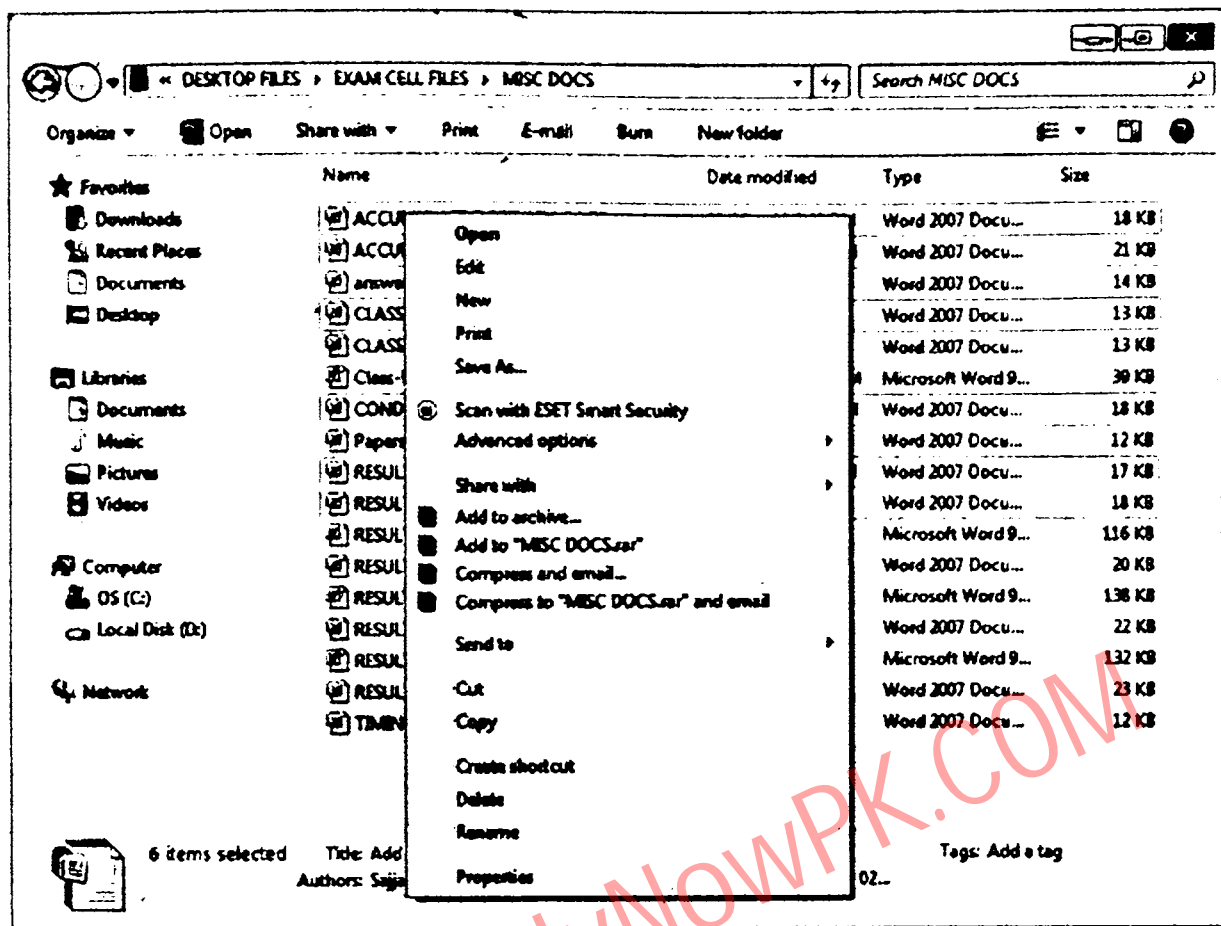
1. Go to the location where a folder is to be created.

2. Right-click a blank area, point to New in the shortcut menu and then click **Folder** as shown in Fig.
3. Type a name for the new folder and then press **Enter** key.

Shortcut menu to create a folder

Q.8 List the various steps to copy or move files.

Ans: Steps to copy or move files:

The following are the steps to copy or move files.

1. Go to the location from where files are to be copied or moved.
2. Select the files to copy or move.
   To select consecutive group of multiple files or folders, create a selection around the outside of all the items by dragging the mouse pointer.
   To select non-consecutive group of files or folders, press and hold down the **Ctrl** key and then click each item one by one.
   To select all the items in a window, click **Organize** on the toolbar and then click **Select all**.
3. Right-click on any selected file icon and then select copy or move from the shortcut menu as shown in Fig.
4. Go to the location where the files are to be copied or moved.
5. Right-click a blank area and click **Paste**.

Shortcut menu for copying or moving files

Q.9 List the various steps to delete files or folders.

Ans: The following are the steps to delete files or folders.

1. Go to the location from where files or folders are to be deleted.
2. Select the items to delete as describe earlier.
3. Right-click any selected item and then click **Delete** in the shortcut menu.

Do you Know?

There are six different versions of Windows 7. These are Starter, Home Basic, Home Premium, Professional, Enterprise and Ultimate

Q.10 What is system installation?

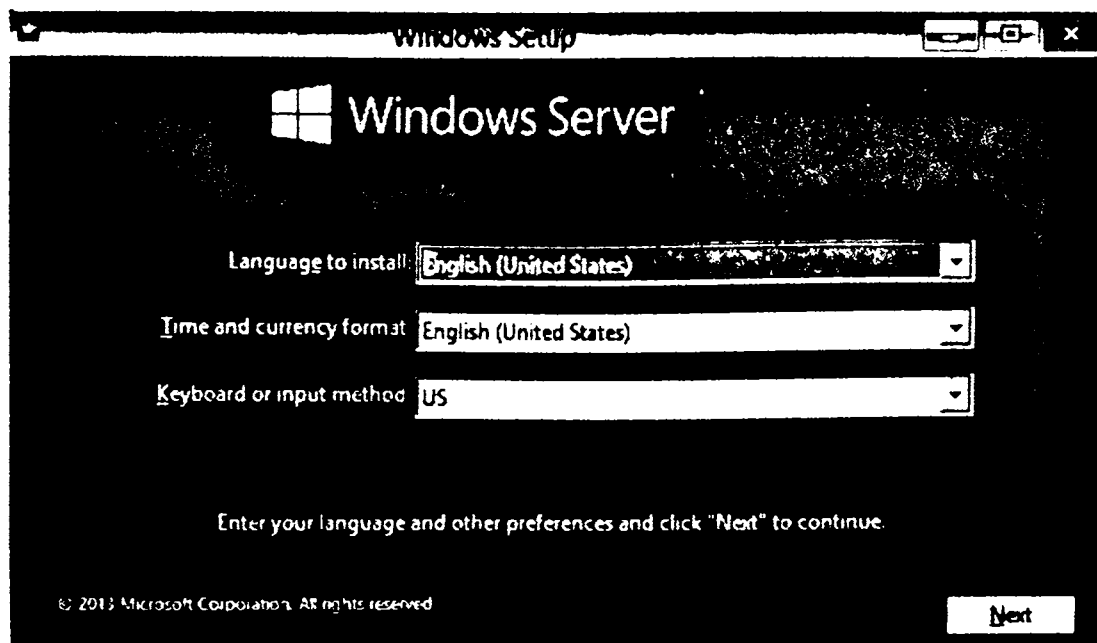
Ans: System Installation:

A computer system consists of hardware and software. Before the use of computer, user must install the operating system and other required software.

Q.11 Briefly explain the process of installation of window 10 Operating System?

Ans: Installation of Windows 10 Operating System:

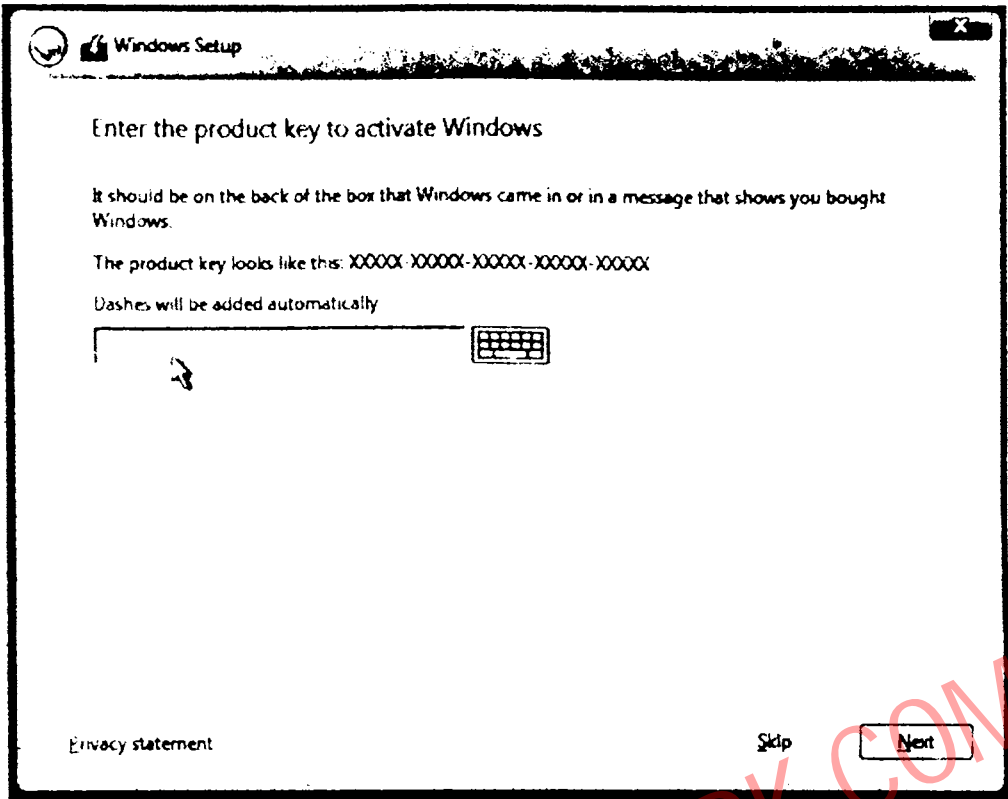
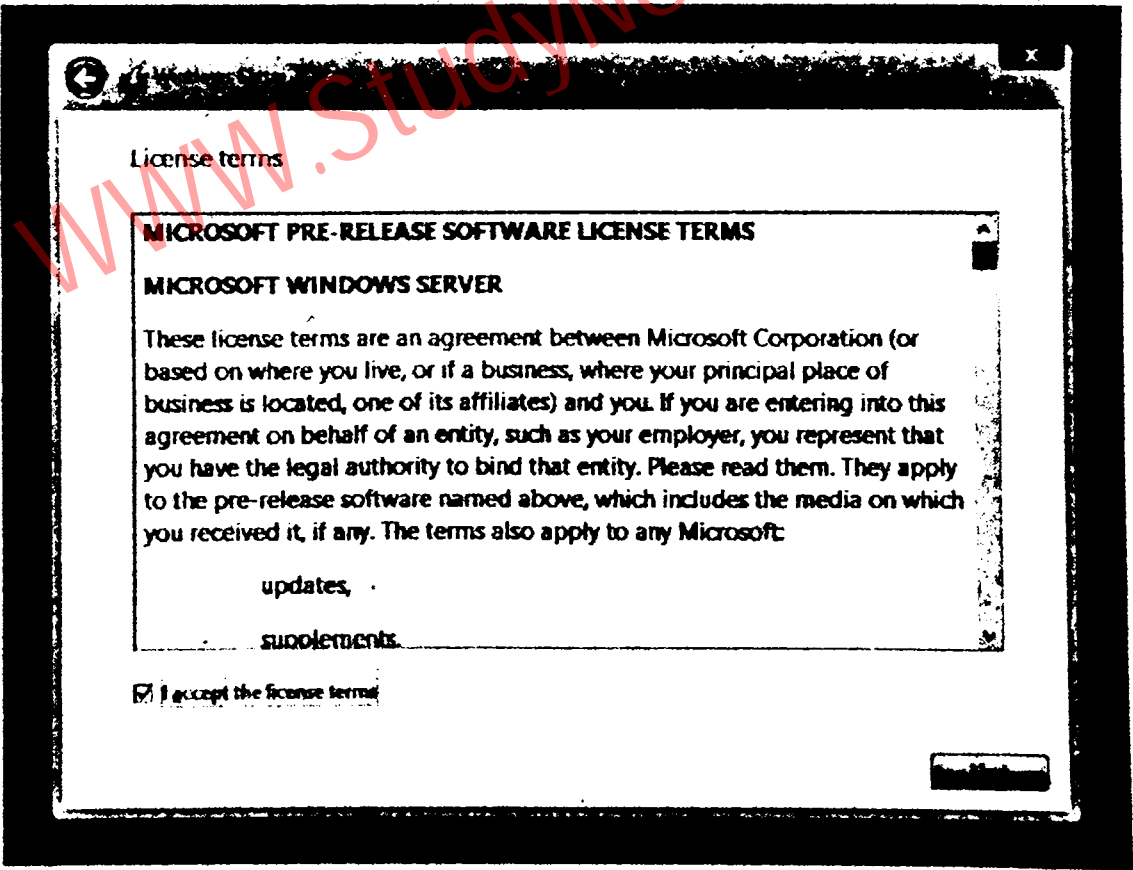
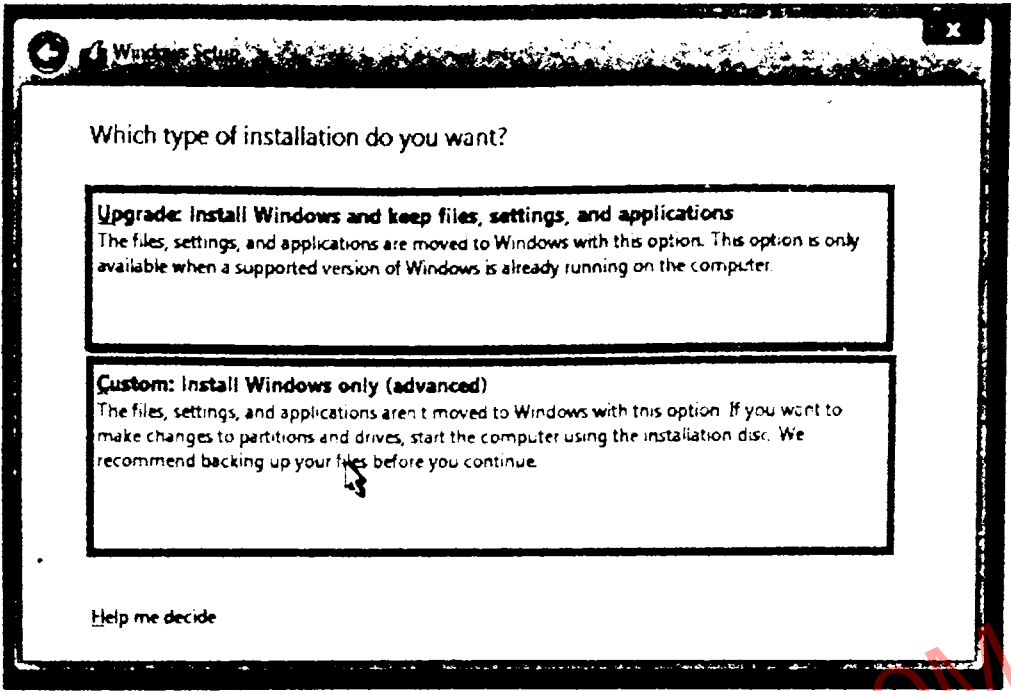
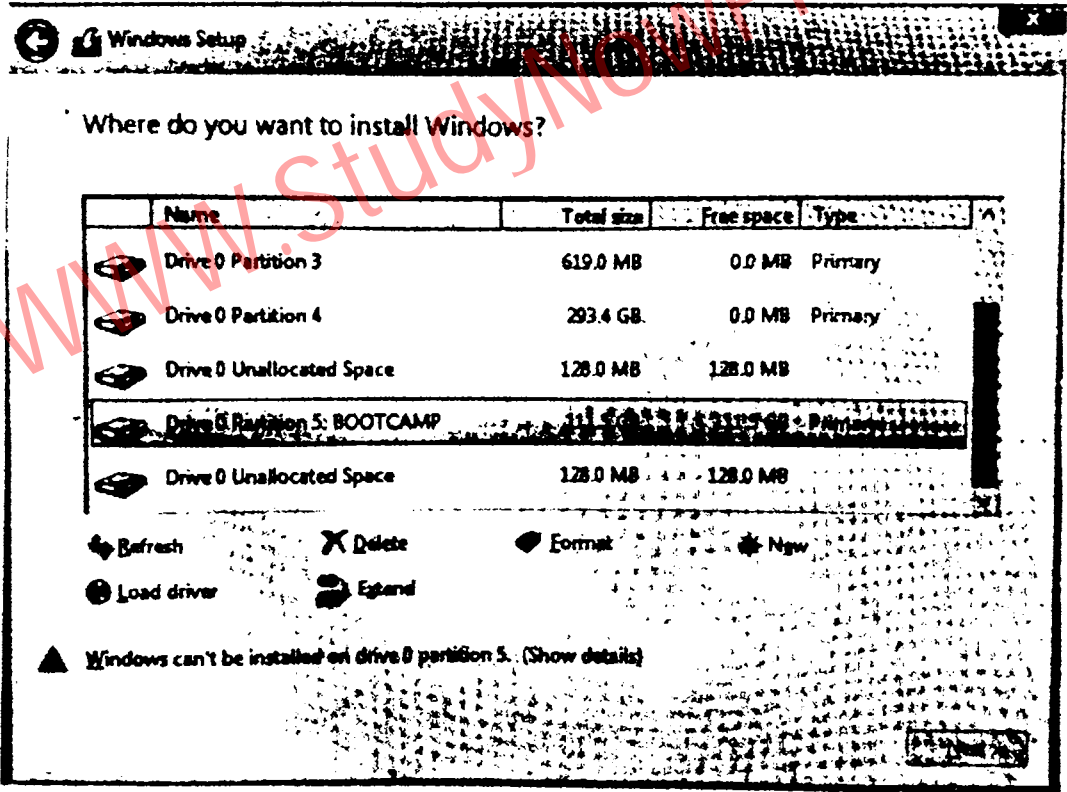
The following are the steps for installation of Windows 10 operating system.

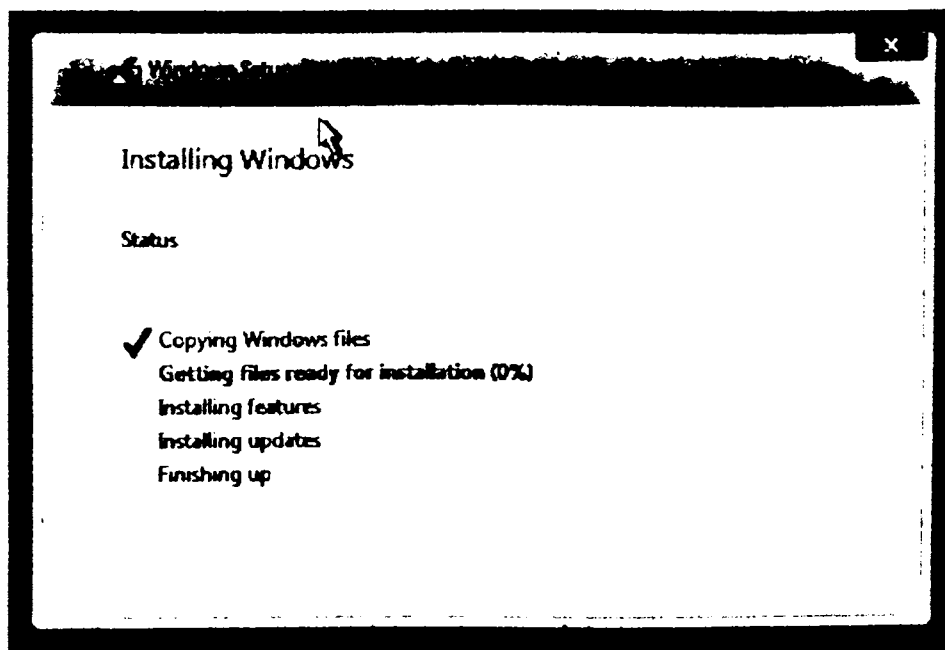
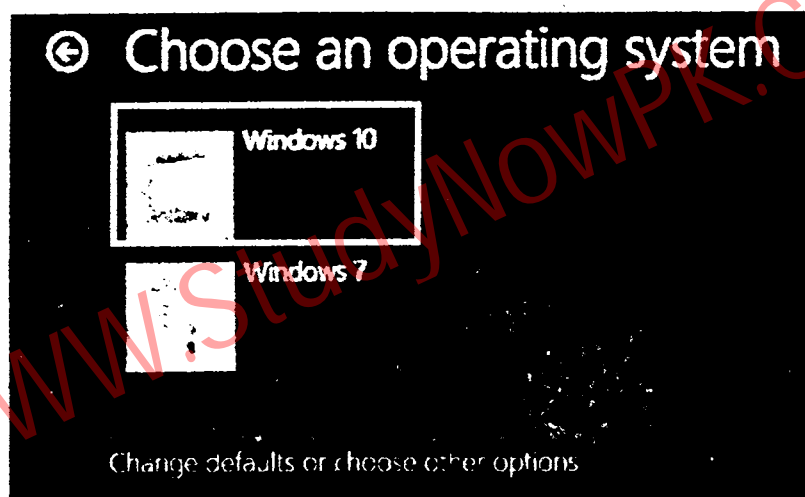
1. Turn on the computer and insert the Windows 10 DVD and boot the computer. Make sure DVD is set as the first boot device.
2. When the screen shown in Fig. appears, select the Language, Time and currency format, Keyboard or input method and click **Next**.

Screen to select language and time and currency format

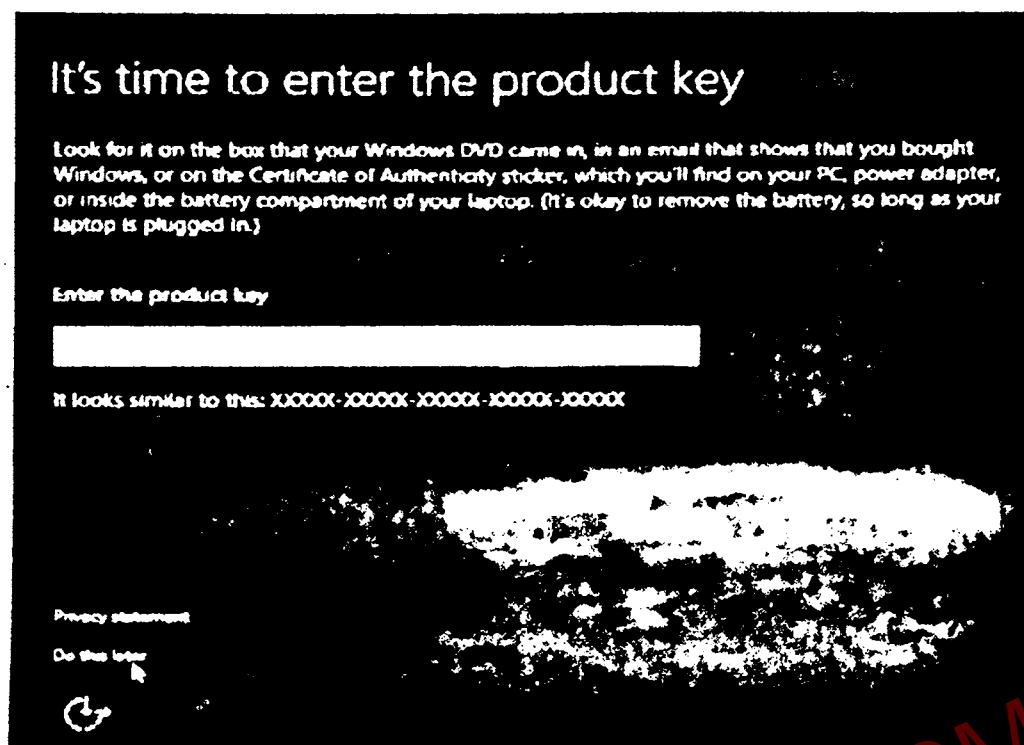
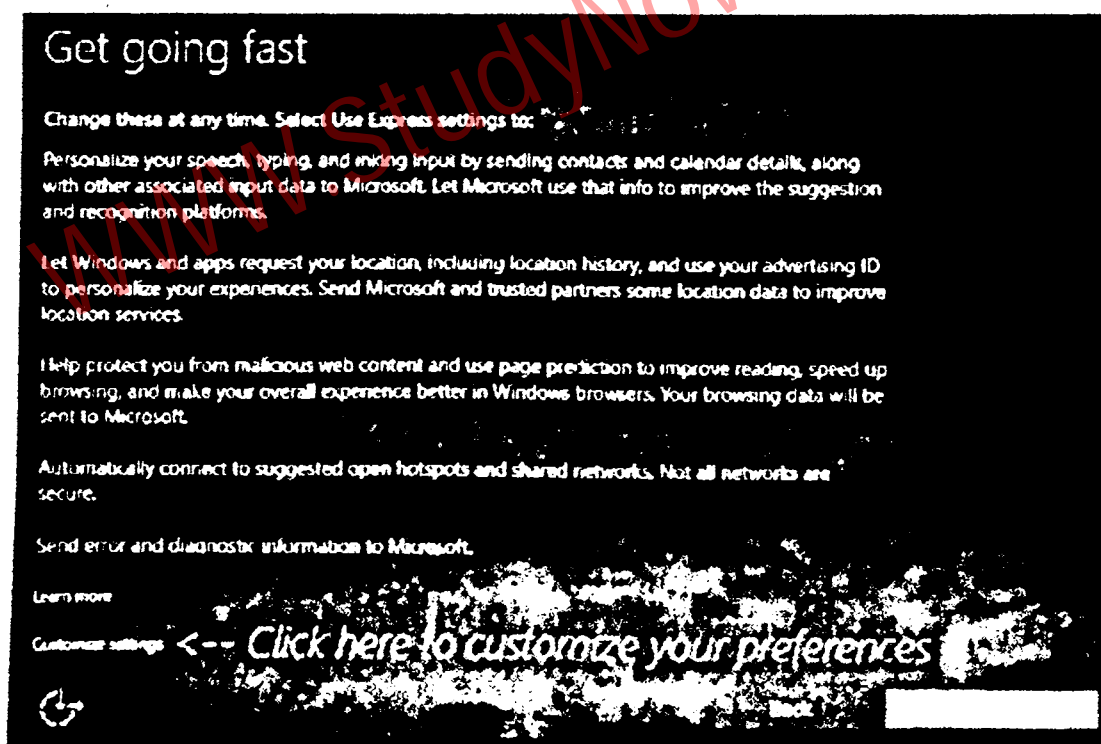
3. Click Install now in the screen shown in Fig. to start installation of Windows 10.

Screen to Install now

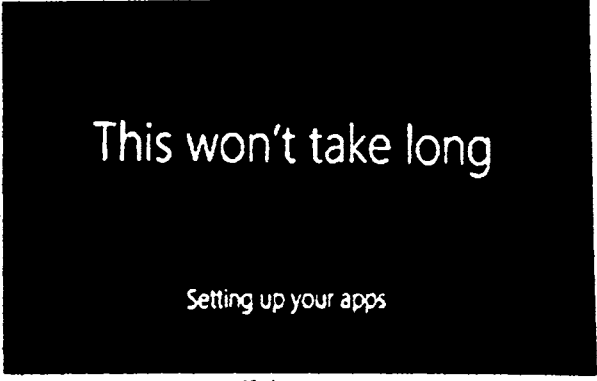
4. Wait for a few seconds for the setup to start (Fig).

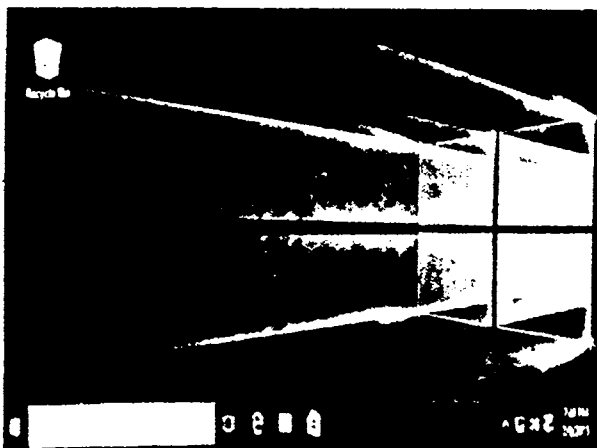
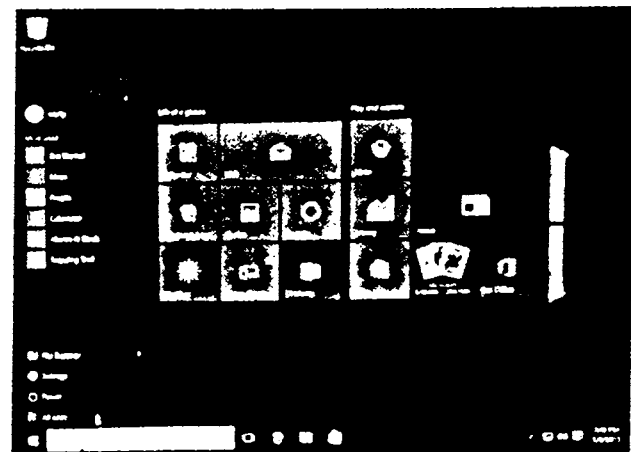
5. If you have a product key, enter it, otherwise click on Skip (Fig).

6. Accept the license terms and click on Next (Fig).

7. Select "Custom: install Windows only (Advanced)" (Fig).

8. Select the drive where you want to install Windows 10 (Fig).

Note: Make sure the drive is formatted, if not you can format by selecting the format option provided.

9. Wait for a sometime until Windows is being installed. This may take from a few minutes to an hour depending on the hardware of your personal computer. Once this process is complete, your PC will restart (Fig).

10. Choose Windows 10 (Fig).

11. Wait for some more time (Fig).

12. Enter a serial key, otherwise click on Do this later to skip this option (Fig).

13. Click on Use express settings to use the recommended settings. Alternatively you can even click on Customize settings to customize the settings (Fig).

14. Wait for a few seconds more (Fig).

15. Enter a name and password to create your account (Fig).

16. Wait for a few seconds more (Fig).

(a) (b)

17. There you go, you are finally on Windows 10 (Fig).

(a)

(b)

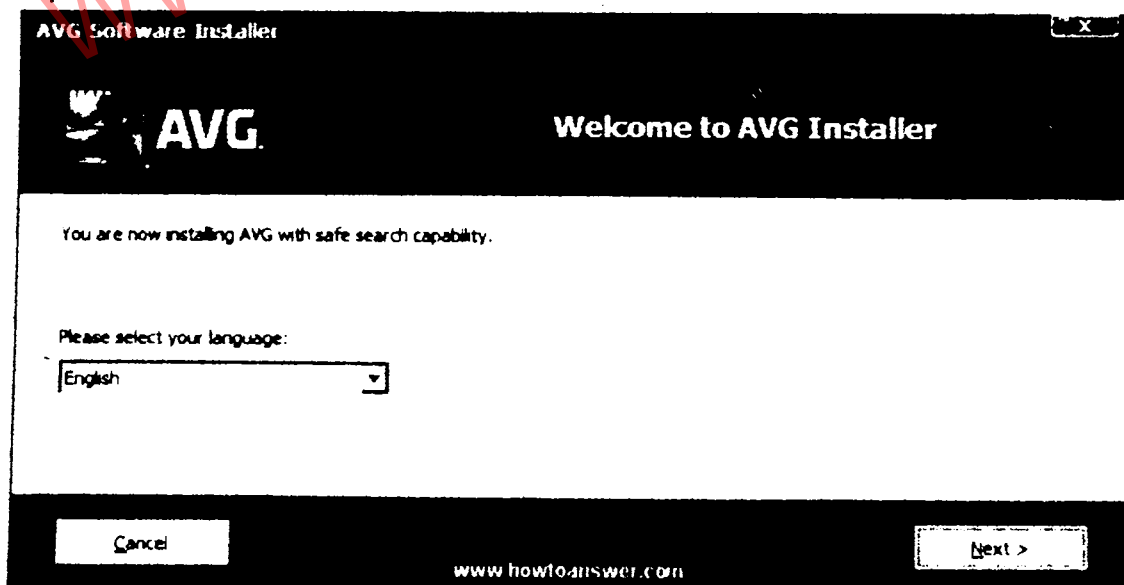
Q.12 Briefly explain the process of installation of antivirus software.

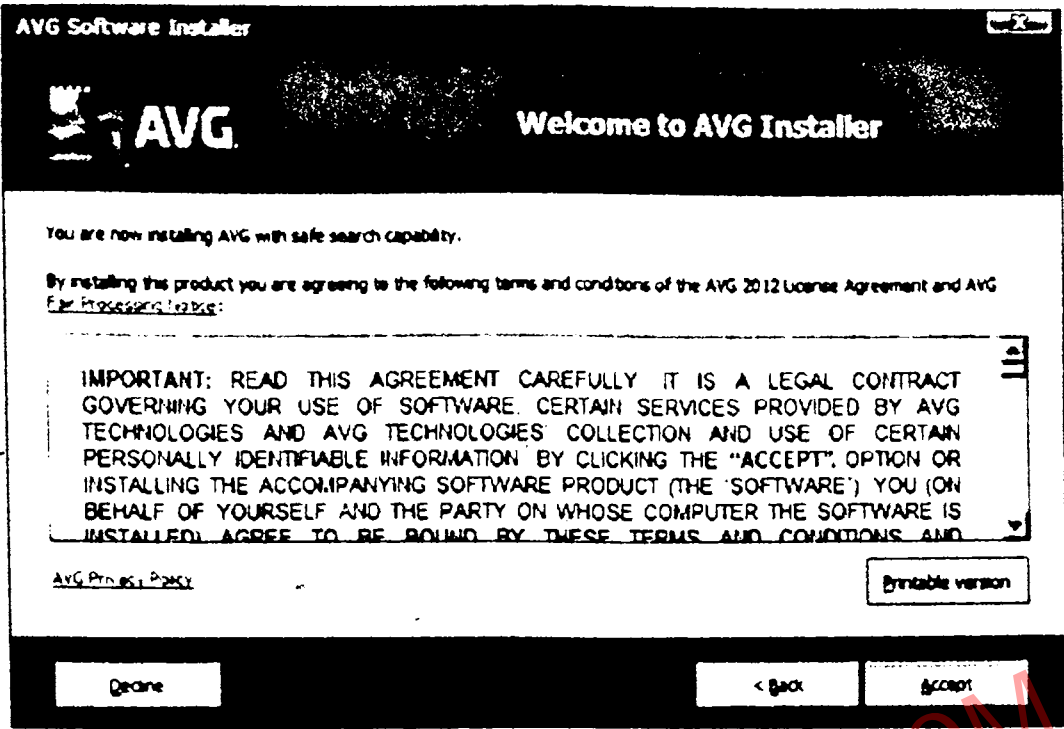
Ans: Installation of Antivirus Software:

The following are the steps for installation of AVG Antivirus software.

1. Download the AVG Antivirus Free Edition from Internet that runs on Microsoft Windows.
2. Double-click on the installation program shown in Fig.

Icon of AVG Antivirus program

3. Welcome screen will appear as shown in Fig. Click the Next button to proceed with the installation.

Welcome screen of AVG Antivirus

4. License Agreement screen will be displayed as shown in Fig. Click Accept to continue with the installation.

License Agreement screen

5. Select Express Install in the screen shown in Fig. and click Next.

AVG Software Installer

AVG Anti-Virus FREE EDITION

Select type of installation

Express Install (recommended)

Installs the software in its standard configuration. Installs the AVG Security Toolbar to protect your computer from dangerous websites.
Sets, keeps and protects AVG Secure Search as your default search provider.

Custom Install

Choose which application features you want installed. Recommended choice for advanced users.

Sets, keeps and protects AVG Secure Search as your default search provider

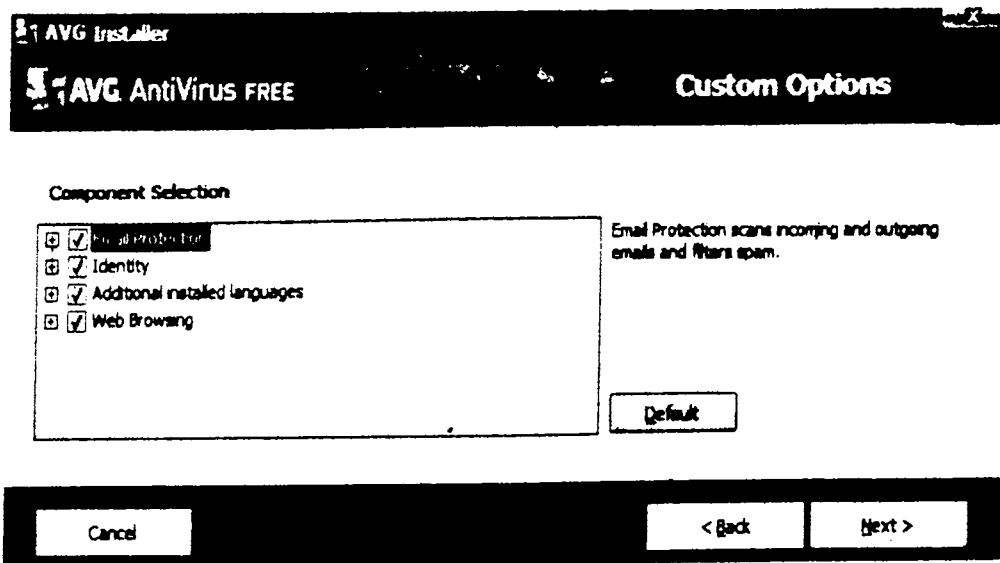
Installs the AVG Security Toolbar to protect your computer from dangerous websites

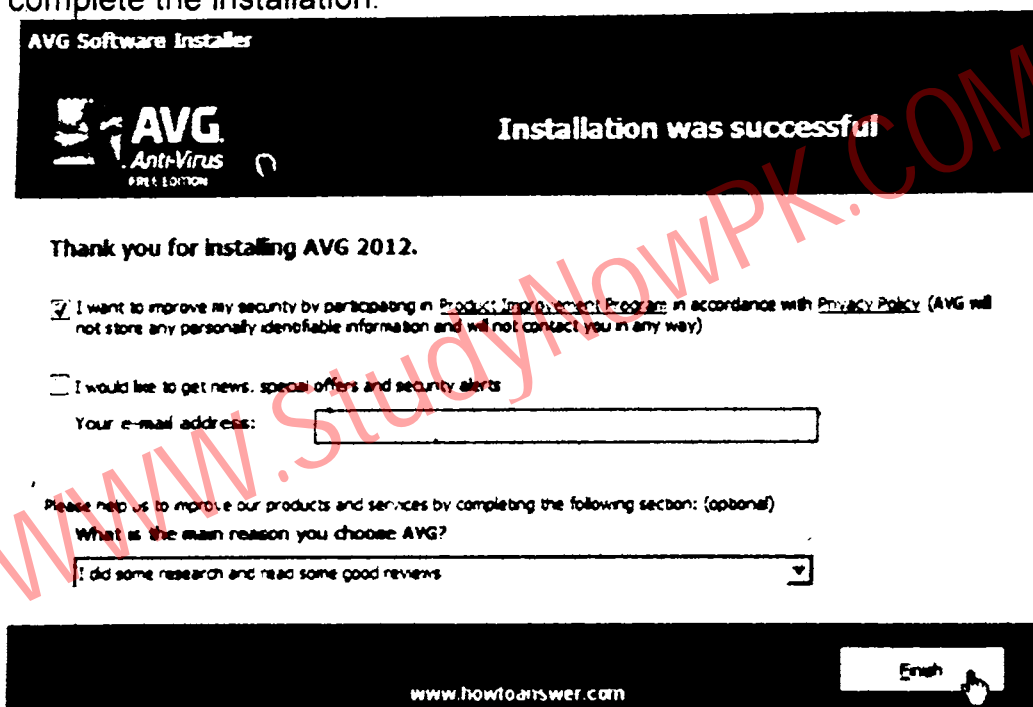
Destination folder:

C:\Program Files\AVG\AVG2012\ | Browse ... | Default

Cancel | www.howtoanswer.com | < Back | Next >

Screen to select type of installation

6. Click Next to accept the default Component Selection shown in the screen of Fig.

Screen to select custom options

7. Tick (✓) the option in the screen of Fig. if required and click Finish to complete the installation.

Screen to finish the installation

Do you Know?

The first antivirus software was developed by Bernd Fix in early 1987 to remove Vienna virus.

Q.13 What are the objectives of windows defender?

Ans: Windows Defender:

Windows 10 comes with Windows Defender which is anti-virus software. Now, computer users do not have to buy anti-virus software.

When Windows 10 is installed on a computer, Windows Defender is also installed as built-in anti-virus software. It runs in the background and checks for viruses. It automatically scans programs and files that user opens or downloads.

If any type of malware is detected, it will display warning message and recommend what to do next to keep the computer safe.

KEY POINTS

- Operating System is a collection of system software that controls the working of computer system and acts as an interface between the computer user and computer.
- The main objectives of operating system are convenience and efficiency. It makes the computer more convenient to use.
- Memory Management is the process of allocating memory space for user programs in main memory and managing it.
- Input/output Management is the process of controlling the operation of all the input/output devices attached to computer.
- File Management System is the part of operating system that organizes, stores and keeps track of computer files and folders.
- Resource Management refers to the automatic management of resources of a computer by the operating system when application programs are executed by computer user. Resources of a computer are CPU, memory, input/output devices, etc.
- User Management is an important feature of operating system for creating and managing user accounts for a secure computer system.
- Command Line Interface (CLI) is a type of computer interface that is based on textual input. In CLI, commands are given with a keyboard.
- Menu Driven Interface presents a menu on the screen and the user makes a choice and then the next menu appears. The user makes another choice and so on to operate the computer.
- GUI is a graphical interface for computer users to interact with computer. It uses windows, icons, menus and pointer. To perform a task, the user has to select icons or make choices in menus using a mouse.
- The operating system that is used by a single user at a time is known as Single user Operating System. It is used in microcomputers.
- Multi-user Operating System allows many users to use a computer at the same time. These are used on large computers such as minicomputers and mainframes. They manage a large number of users.
- Batch Processing System groups jobs in batches and the computer executes them one by one.
- Time-sharing System is a feature of operating system in which multiple users can run different programs on a large-scale computer. It allows many users to have access to a computer at the same time and share the computer's time.
- Real-time System must process information and produce a response within a specified time. It is developed for special applications.
- Recycle Bin is a temporary place (folder) for items that the user deletes form the hard disk. Deleted items can be restored if required.

- Computer icon allows the user to access the contents of computer drives and manage files and folders.
- Folder icon resembles a physical file folder and it is used to store files.
- In a GUI files are represented by file icons. A file can be easily recognized by looking at its icon. It opens by double-clicking on it.
- Program icons represent executable program files. They open when the user Double - clicks on them.
- Shortcut icons are created to access a program, file or folder quickly. They have an arrow at bottom left corner and the name below it.
- Managing Data means storing files in secondary storage devices such as hard disk or USB flash drive, in an organized way in folders so that they can be accessed easily and quickly when needed.

EXERCISE

Q1. Select the best answer for the following MCQs.

i. Which interface is based on textual input?

A. GUI B. CLI
C. Menu-driven interface D. Windows

ii. Which of the following interface uses window, icon, menu and pointer to interact with computer?

A. GUI B. CLI
C. Menu-driven interface D. DOS

iii. Which of the following operating system was introduced in 1969?

A. Macintosh B Linux
C. Unix D. Windows

iv. Which of the following operating system must process information and produce a response within a specified time?

A. Batch Processing System B. Time-sharing System
C. Multiprogramming System D. Real-time System

v. Which of the following is open source operating system?

A. UNIX B. Linux
C. DOS D. Novell's Netware

vi. Which of the following user interface is the easiest one to learn and use?

A. CLI B. GUI
C. Menu driven interface D. DOS

vii. Which of the following operating system allows many users to use a computer at the same time?

A. Single-user operating system B. Batch processing system
C. Real-time processing system
D. Multi-user operating system

viii. In which of the following operating system, CPU is switched rapidly between all the programs to simultaneously execute all of them?

A. Batch Processing System B. Time-sharing System

C. Real-time System D. DOS

ix. **Which of the following Windows icon allows user to access a program, file or folder quickly?**

A. Program icon B. Computer icon
C. Shortcut icon D. Recycle Bin icon

x. **Which of the following Windows icon allows user to access the contents of computer drives and manage files and folders?**

A. Program icon B. Computer icon
C. Shortcut icon D. Recycle Bin icon

Answers

i. B	ii. A	iii. C	iv. D	v. B
vi. B	vii. D	viii. B	ix. C	x. B

Q2. Write short answers of the following questions.

i. Why operating system is important software for a computer? Give any five reasons.

Ans: Functions of operating system:

The following are the main functions of operating system.

- Process Management
- Memory Management
- Input/Output Management
- File Management
- Resource Management
- User Management

Due to these reasons operating system is important software for a computer.

ii. Give any three objectives of operating system?

Ans: Objectives of operating system (OS):

The main objectives of the operating system are convenience and efficiency. It makes the computer more convenient to use. It allows computer resources such as CPU, memory, input/output devices and Internet to be used in an efficient manner. It can be viewed as a resource manager.

iii. Mention few disadvantages of using DOS.

Ans: User must know the syntax of the command. DOS commands are difficult to remember. It is a single user and single task operating system.

Its character base interface therefore cannot support graphics. Its cannot use easily as Graphics user interface.

iv. Name two operating systems which are used in modern mobile phones.

Ans: Popular Mobile Operating Systems:

- Android OS (Google Inc.)
- Bada (Samsung Electronics)
- BlackBerry OS (Research In Motion)
- iPhone OS / iOS (Apple)
- MeeGo OS (Nokia and Intel)
- Palm OS (Garnet OS)
- Symbian OS (Nokia)

- webOS (Palm/HP)

v. What difficulties a student may face if he/she is not familiar with the operating system of a computer?

Ans: Computer user must know how to give commands to the computer to operate it properly

Computer user must know basic knowledge about operating system. It teaches the user how to use the operating system to run programs and manage files and folders.

Without basic knowledge about operating system, a computer is useless.

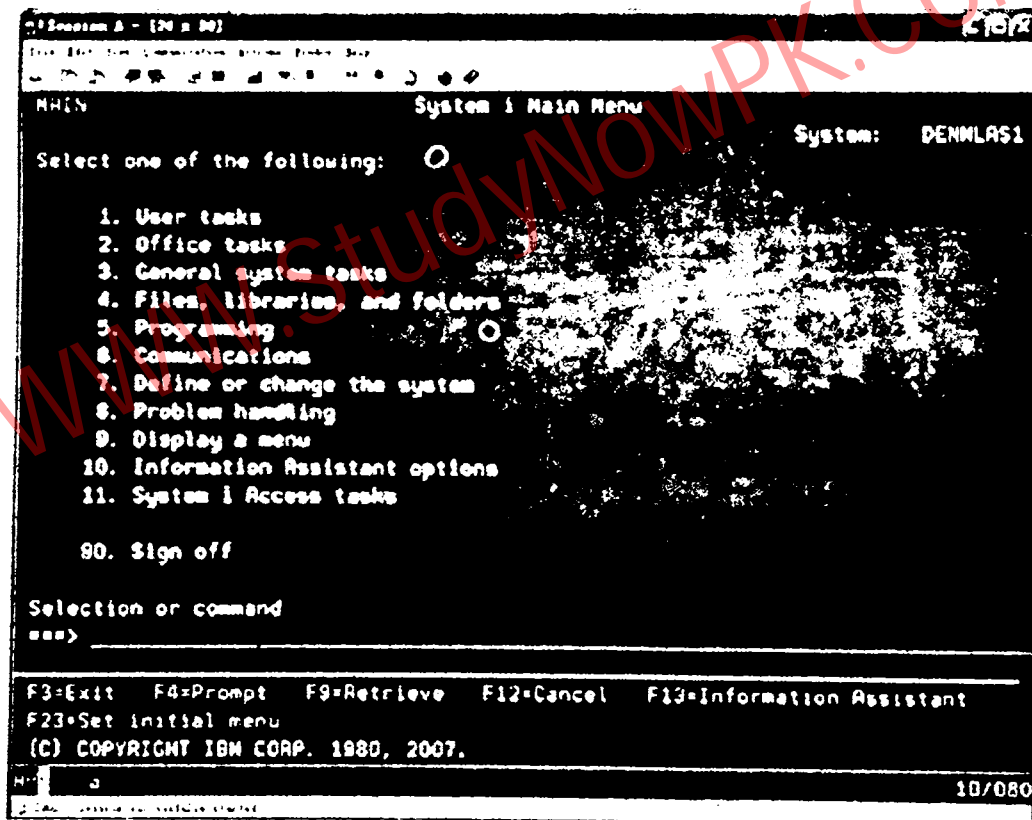
Student may face difficulties of the steps involved in installation of operating system, office automation software and antivirus software in computer.

Therefore a student must familiar with the operating system of a computer.

vi. Define UNIX and Windows operating system.

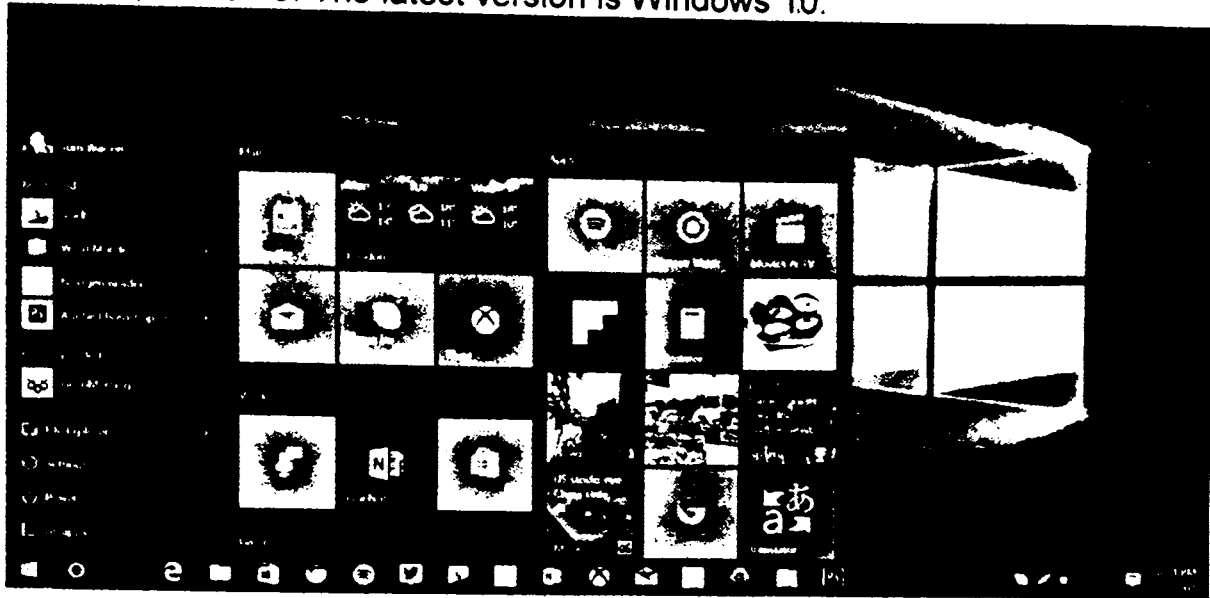
Ans: UNIX:

UNIX Operating System:

UNIX is a multi-user CLI operating system introduced in 1969. It allows multiple users to run different programs at the same time. UNIX was developed for use on large computer system (Mainframe). It uses a command line interface but later Graphical User Interface was also introduced. UNIX commands are shown in Fig.

UNIX Interface

Windows Operating System:

Windows is the most popular operating system used on microcomputers. It was developed by Microsoft. Many different versions of Windows operating system were developed and used successfully in the past. Some of these versions are

Windows 95, Windows 98, Windows Millennium, Windows XP, Windows Vista, Windows 7, 8 and 10. The latest version is Windows 10.

Windows 10 Interface

vii. Differentiate between single-user and multi-user operating systems.

Ans: Difference between single-user and multi-user operating systems:

Single-user Operating System:

Operating system that is used by a single user at a time is known as single-user operating system.

- It allows a single user to login and use the computer at a time. It is easy to use.
- Resources of the computer, such as CPU, memory and input/output devices are not shared with other computers.
- It is used on microcomputers.
- User can open many programs at the same time and switch among them as required.
- It requires less memory and costs less.
- Some examples of single-user operating systems are DOS, Windows 95, Windows XP, Windows 7, etc.

Multi-user Operating System:

Operating system that allows many users to use a computer at the same time is known as multi-user operating system.

- It allows many users to login to a single big computer and run different programs at the same time.
- It shares the resources of the computer with other users over the network.
- It is used on minicomputers and mainframes.
- Users can communicate with each other and share files.
- A person known as administrator is responsible for assigning and managing user names and passwords.
- It requires a powerful CPU, large memory and large hard drives.
- It supports multiprogramming and time-sharing.
- Windows NT, UNIX and Linux are popular multi-user operating systems.

viii. What is meant by managing data and why is it important?

Ans: Managing Data (Files/Folders):

Managing data means storing files in secondary storage devices such as hard disk or USB flash drive in an organized way. This helps in finding files easily and quickly. Files are stored in folders. The Document folder in Windows is the default folder where the user saves files.

File management tools of GUI operating system provide facilities to quickly and easily create folders and copy or move files into them. It also allows the user to delete files and folders that are not needed any more.

ix. What is meant by resources of computer?

Ans: Resource of computer:

Operating system automatically manages the resources of a computer when application programs are executed by computer user.

The resources of a computer include microprocessor, memory and all the devices attached to the computer. Operating system allocates resources of a computer to the application program according to the user's requirement in an efficient way to improve the performance of the computer.

x. What types of problems may a student face if no antivirus is installed in his/her computer system.

Ans: Problems faced if no antivirus is in installed computer system:

Computer virus will damage data, software, or the computer itself.

A computer virus is a program that literally infects other programs and databases upon contact.

Some of the activities that a virus has been programmed to do are:

i. Copy themselves to other programs.
ii. Display information on the screen.
iii. Destroy data files.
iv. Erase an entire hard disk.
v. Lie dormant for a specified time or until a given condition is met.

Q3. Write long answers of the following questions.

i. Explain the main functions of operating system.

Ans: Main Functions of Operating System:

The following are the main functions of operating system.

- Process Management
- Memory Management
- Input/output Management
- File Management
- Resource Management
- User Management

Process Management:

Process management is an essential part of operating system (OS). A process is a program in execution. In computer system multiple processes are executing concurrently or waiting for their turn to be executed. A process in execution needs resources like processing resource, memory and I/O resources. The OS must allocate resources to processes, enable processes to share and exchange information, and protect the resources of each process from other processes.

Memory Management:

Memory management is the process of allocating memory space for user programs in main memory When programs are run by users, the operating system allocates portions of free memory to programs. When a program is closed, operating system will free the memory portion used by that program for reuse. The operating system automatically loads user programs in available memory space and executes them.

Input/output Management:

Input/output management is the process of controlling the operation of all the input/output devices attached to computer. User communicates with computer through various input/output devices such as keyboard, mouse, monitor printer, etc. Management of these devices is the responsibility of operating system. Operating system uses Input/output controller to manage and coordinate the operation of all the input/output devices.

File Management:

File management system is part of operating system that organizes stores and keeps track of computer files and folders. Computer files can be documents, programs, images, videos, etc. Operating system controls the common operations performed on files. These operations include creating, opening, editing, renaming, moving, copying, deleting and searching files.

Resource Management:

Operating system automatically manages the resources of a computer when application programs are executed by computer user. The resources of a computer include microprocessor, memory and all the devices attached to the computer. Operating system allocates resources of a computer to the application program according to the user's requirement in an efficient way to improve the performance of the computer.

User Management:

User management is an important feature of operating system for maintaining a secure computer system. The operating system gives full control over a computer system to a person known as administrator. Administrator installs various programs on the computer system for users. He also creates and manages user accounts. When a user account is created, the user is assigned a user name and a password. Administrator allows the users to run various application programs that are installed on the computer. A user can login to the computer system by entering the user name and password, run programs and save his files in his personal folder. Operating system does not allow the users to install programs or create new users.

ii. Describe the following computer interfaces.

a) Command Line Interface

b) Graphical User Interface

c) Menu-driven Interface

Ans: a) Command Line Interface:

In CLI, commands are given to computer with keyboard. It is based on textual input. The user types in a command and presses the Enter key to execute it. Two commonly used operating systems that use CLI are DOS (Disk Operating

System) and UNIX. CLI is difficult to use because users have to remember the commands to perform any task.

b) Graphical User Interface:

GUI is a graphical interface for computer users to interact with computer. It uses windows, icons, menus and pointer. Window is a rectangular portion of monitor in which information is displayed. Icon is a graphical symbol that represents a file, folder, program, device, etc. To perform a task, the user has to select icons or make choices in menus using a pointing device such as mouse.

The following are the advantages of GUI.

i. Much easier to learn and use
ii. No need to memorize the commands
iii. Allows users to run more than one program at the same time
iv. Most of the GUIs provide good help facilities
v. Many application programs also use a similar interface so it is easy to use a new program

The following are the disadvantages of GUI.

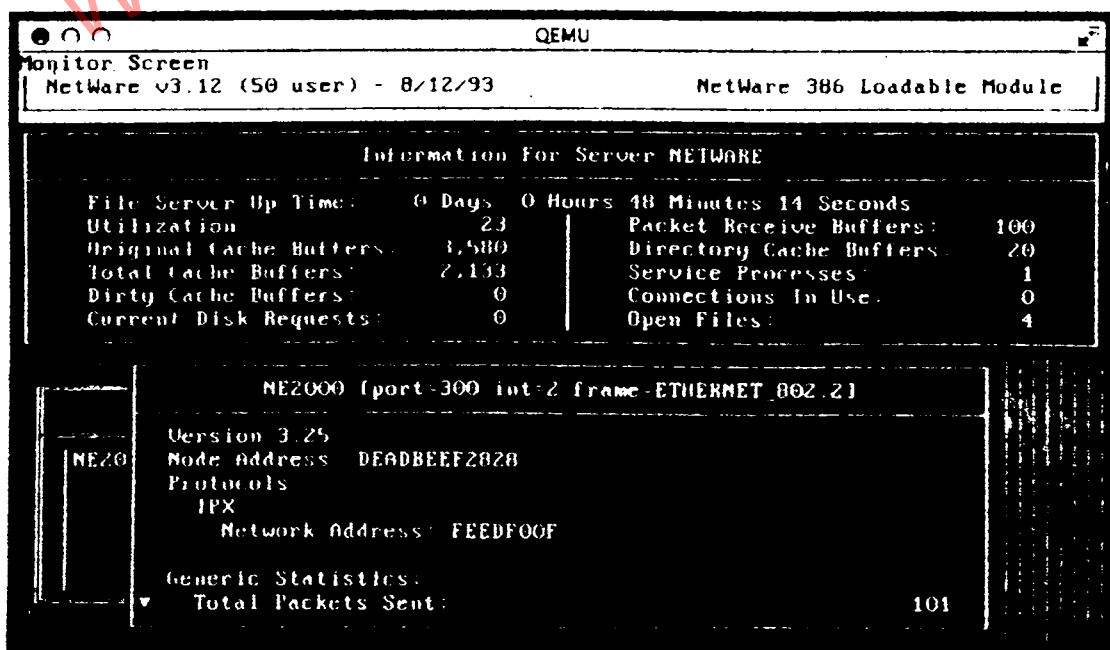
i. Takes up lot of memory.
ii. Needs faster computer as compared to other interfaces.

Examples of operating systems that use GUI are Macintosh, Linux and Windows.

c) Menu-driven Interface:

Menu driven interface presents a menu on the screen, user makes a choice and then the next menu appears. The user makes another choice and so on. Menu driven interface is easy to use as compared to CLI. The user reads the options and makes his choices. Menus contain the commands to use the operating system. Menu driven interface is also used in some application programs and other devices such as mobile phone and iPod.

The following are two common menu driven operating systems

- **Novell's Netware:**

Novell Netware Interface

Novell's Netware was a menu-driven operating system that was used in the past. Its first version was released in 1993. Novell's Netware interface is shown in Fig.

- **ProDOS:**

ProDOS was another menu-driven operating system that was used on some Apple computers. ProDOS interface is shown in Fig.

ProDOS Interface

iii. Describe the following types of operating systems.
a) Batch Processing System
b) Time-sharing System
c) Real-time System

Ans: a) Batch Processing System:

In a batch processing system, jobs are grouped in batches and the computer executes them one by one. When the current job terminates, the computer automatically loads the next job and starts executing it. Batch processing operating systems greatly improved the use of computer system.

Batch processing systems are suitable for tasks where large amount of data has to be collected and processed on a regular basis.

For example, in credit card billing systems, all the data of credit card holders is collected and held until processed as a batch at the end of billing cycle. As another example, in examination report card system, all the data of student's examinations is collected and processed as a batch for printing report cards.

b) Time-sharing System:

Timesharing system is a feature of operating system in which multiple users can run different programs on a large-scale computer, It allows many users to have access to a computer at the same time and share the computer's time. In a timesharing system, the central processing unit is switched rapidly between the programs so that all the user programs are executed simultaneously.

The operating systems used in minicomputers and mainframe computers support timesharing. Timesharing operating systems are used in organizations such as airline, bank, hotel, university, etc. where many users need access to the central computer at the same time.

For example, hundreds of students access the university's mainframe computer at the same time and they run different programs in a timesharing system in interactive mode.

c) Real-time System:

Real time operating systems must process information and produce a response within a specified time. These operating systems are developed for special applications.

These are used to control industrial processes such as oil refining. Real time operating systems are used to supply immediate response within limited time. For example, a measurement from an oil refinery indicating that temperatures are getting too high might demand quick response to avert an explosion.

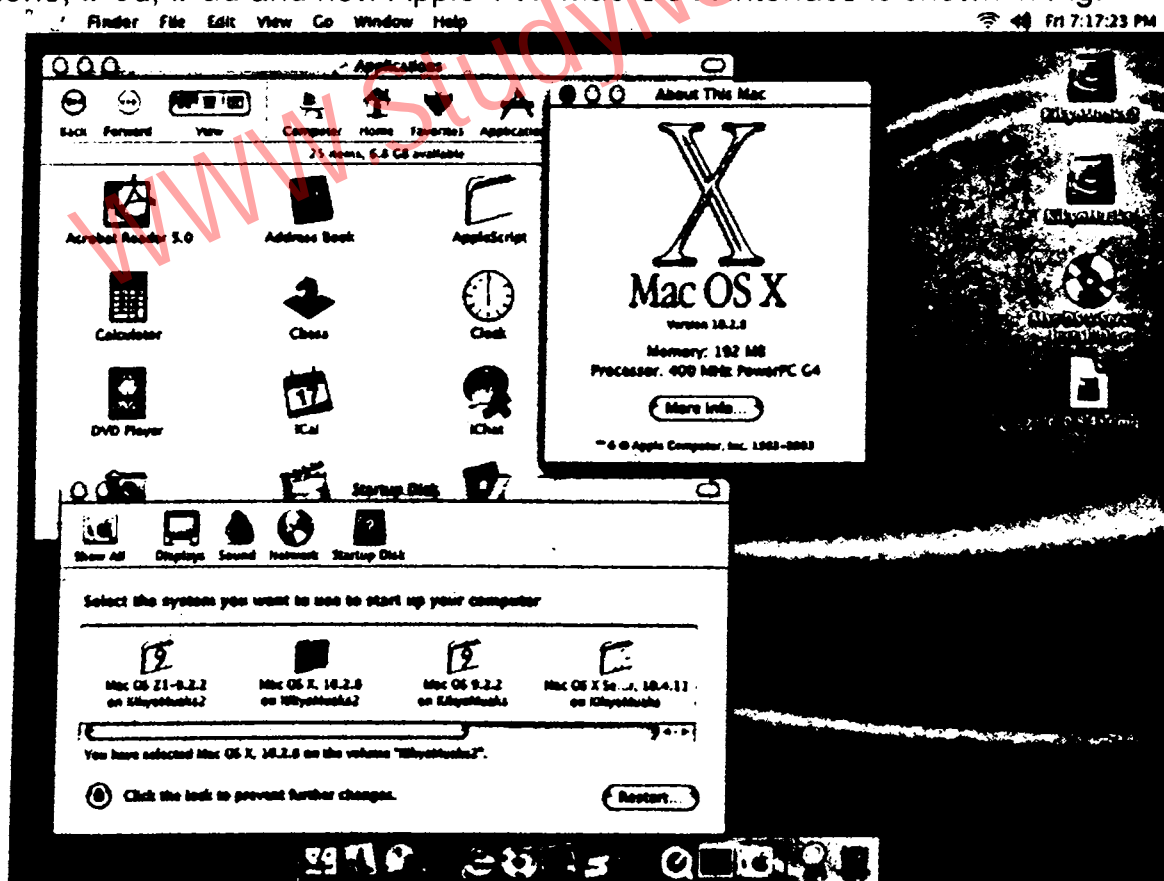
There are a number of real-time operating systems used in military and space research programs.

For example, real-time operating system is used to monitor the position of rocket in the space. Many cities are installing real-time traffic control systems to facilitate smooth flow of traffic at busy intersections.

iv. Write notes on Macintosh and Linux operating systems.

Ans: Macintosh Operating System:

Mac OS is a series of operating systems developed by Apple Incorporation for their Macintosh computers. It was introduced in 1984 with the original Macintosh computer and has GUI.

The latest version is Mac OS X. It is a UNIX based user-friendly operating system. There are some specialized versions of Mac OS X used on devices such as iPhone, iPod, iPad and new Apple TV. Mac OS X interface is shown in Fig.

Mac OS X Interface

Linux Operating System:

Linux is free open-source operating system introduced by Linus Torvalds in 1991. It is faster but difficult to use as compared to Macintosh and Windows operating systems. It is not a popular operating system.

Linus Torvalds started the development of Linux operating system and laid its foundation. Millions of programmers around the world work on Linux to improve it.

Its source code is freely available on Internet. Programmers can view, edit and publish an improved version.

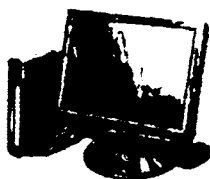
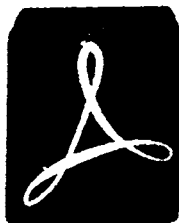
Linux OS can be installed on PCs, laptops, netbooks, mobile and tablet devices, video game consoles, servers, supercomputers and more. The Linux OS is frequently packaged as a Linux distribution for both desktop and server use, and includes the Linux kernel (the core of the operating system) as well as supporting tools and libraries.

Popular Linux OS distributions include Debian, Ubuntu, Fedora, Red Hat and openSUSE. Linux operating system interface is shown in Fig.

Linux Interface

v. Describe the basic icons of Windows operating system.

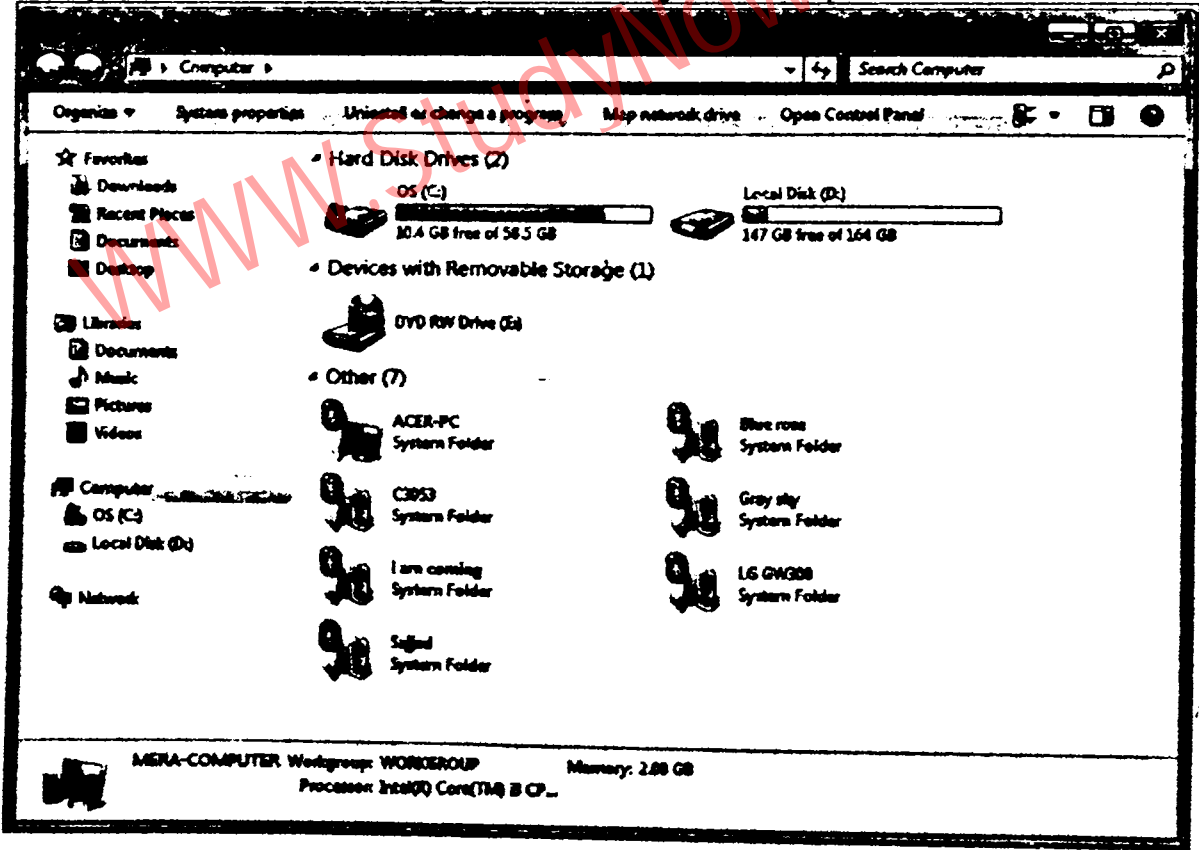
Ans: Basic Icons of GUI operating System/basic icons of Windows operating system:

An icon is a small graphical symbol that represents a file, folder, application or device. There are some special system icons such as Recycle Bin and Computer that are kept on the desktop. Icon has a label at the bottom describing its name. The basic icons of Windows 7 are shown in Fig. and are described below.

(a)Recycle Bin (b)Computer icon (c)Folder icon

(d) File icon (e) Program icon (f) Shortcut icons

Recycle Bin:

It is a temporary place (folder) for items that the user deletes from the hard disk. When a file or folder is deleted from a hard disk it goes to the Recycle Bin. The user can restore it to its original location. User can also delete a file or folder permanently from the Recycle Bin. Icon of a Recycle Bin is shown in Fig (a).

Computer Icon:

Computer icon allows the user to access the contents of computer drives and manage files and folders. When user double-clicks on Computer icon, it will open a window similar to the one shown in Fig. that displays the drives present in the computer. It is used to navigate and manage the computer resources.

Computer – Icon window

Folder Icon:

Folder icon resembles a physical file folder It is used to store files. A folder can have another folder inside it which is known as subfolder. Folders are used to keep files in an organized manner on a storage device such as hard disk so that they can be accessed easily.

File Icon:

In a GUI, files are also represented by icons. A file may contain text, image, music or video. Users recognize a file by its icon. Icon of a Microsoft Word file is shown in Fig (d).

Program Icon:

Executable program files are also represented by icons. Different graphical symbols are used for different program icons. Program icon of Acrobat Reader is shown in Fig. (e).

Shortcut Icon:

Shortcut icons are created to access a program, file or folder quickly. They have an arrow at the bottom left corner and the name below it. Shortcut icon of Google Chrome is shown in Fig. (f).

Lab Activities

Activity 1:

The commonly used commands for using Windows operating system should be demonstrated. Students should be shown how to open and close a program. The commands for setting date and time, adjusting resolution, changing desktop background, color scheme, screen saver, etc. should be demonstrated.

Activity 2:

The file management commands such as create folder, copy, move, delete, rename files and folders are to be demonstrated. Use of Recycle Bin should be demonstrated.

Activity 3:

Installation and un-installation of a program and antivirus software should be demonstrated to students.